

Region 6 Avian Health Program FY2011 Report

Introduction and background to the Region

The Mountain-Prairie Region (Region 6) encompasses many diverse habitats, from alpine tundra and sagebrush steppe to prairie grasslands and extensive wetlands. The main ecosystems making up Region 6 are the Prairie Pothole area, the Great Plains and the Rocky Mountains. Bird species in the region are similarly diverse. The Prairie Pothole is home to a significant proportion of the continent's breeding waterfowl and also supports some of the largest populations of waterbird species in the country. The diversity of habitats within Region 6 make it an important area for monitoring avian populations for the incursion of novel infectious diseases into North America. Several threatened and endangered species also inhabit Region 6 grassland and sagebrush steppe ecosystems including sage grouse, greater and lesser prairie chickens, and grassland sparrow species.

The region faces several significant avian disease challenges. Botulism type C has been recognized throughout Region 6 since the early 1900's, and continues to cause significant avian mortality annually despite years of research and attempts at management. Individual outbreaks may kill tens of thousands of birds and the FWS expends tremendous resources to control and mitigate this disease. Avian cholera is another recurring disease issue in the region, with significant annual outbreaks and large scale waterfowl mortality occurring in Nebraska's Rainwater Basin. Cholera mortality in this area may also reach tens of thousands of birds in some years, though smaller outbreaks occur elsewhere in Region 6. West Nile virus, despite its relatively recent arrival, has already impacted populations of American white pelican and sage grouse. Current management options have had limited effect at reducing mortality associated with these diseases.

Region 6 has a well-established wildlife health operational unit consisting of 5 staff led by a senior wildlife veterinarian/ecologist. The Wildlife Health Office (WHO) addresses the multitude of avian, mammalian and special emphasis wildlife health issues both within the Region and nationally. The Avian Health program is one portion of the total effort.

FY11 Avian Health Activities

Region 6 received \$357,672 in Avian Health funding. Morbidity and mortality monitoring projects accounted for 50% (\$178,600), disease and health impact research accounted for 32% (\$114,920) and WHO operations accounted for 18% (\$64,152). Each category is described in more detail below.

Morbidity and mortality monitoring

Six prospective mortality surveillance projects involving 9 refuge complexes were funded in 2011. Projects that addressed priorities identified for Refuge I&M were encouraged. Projects targeted areas with significant avian resources, species of management concern, or locations with little or no historic avian health data. Species or groups identified by refuges as priorities for avian health monitoring included colonial nesting waterbirds, threatened and endangered species (piping plovers, least terns, and trumpeter swans), and other waterbird species.

The surveillance year presented a number of challenges to those participating in the Avian Health Program in 2011. The late allocation of funds led to a later than anticipated start date for some projects and hiring difficulties for others. However, through creative rearrangement of staff time and use of volunteers, most proposed work was still completed. Record precipitation and flooding also affected survey logistics and access, and staff adjusted survey sites or methods as necessary to still achieve their mortality surveillance goals. All locations conducting prospective mortality surveillance reported lower levels of mortality in 2011 than has been observed in previous years. An abundance of wetland habitat, leading to lower bird densities was likely a factor. However, it may also have been more difficult to detect carcasses in these more widely distributed populations.

Disease and health impact investigations

Efficacy of carcass removal in mitigating botulism outbreaks in the Prairie Potholes.

WHO continued research to evaluate efficacy of carcass removal in controlling botulism outbreaks. Based on findings from a pilot project conducted in 2010, we purchased 300 radio-transmitters to mark an “at-risk” study population of mallards at paired control and treatment wetlands to compare survival between locations where carcasses were either removed or left in the wetland. Due to an abnormally wet year, flood conditions and large amounts of wetland habitat leading to disbursed waterfowl populations, botulism occurrence and severity in 2011 was extremely low. In absence of an adequate botulism outbreak for full transmitter deployment, we deployed 20 transmitters on mallards at one study site to evaluate transmitter attachment protocol, assess radiotelemetry logistics from road access points and airboat, assess response of ducks to transmitter attachment for future IACUC review, and trained Sand Lake personnel in radiotelemetry in advance of large-scale transmitter deployment.

Health parameters of species of management concern

Two projects at Red Rock Lakes focused on evaluation of health parameters in species of management concern (lesser scaup, and sagebrush-obligate passerines). Both of these have been identified as being in decline due to habitat loss and at potential risk due to climate change. The first study of scaup nesting propensity and health has been ongoing at Red Rock Lakes for several years, and in 2011 a component to evaluate levels of hematozoa in scaup and their relationship to health and nesting propensity was added to the study. Five of fifty scaup were found to harbor various species of hemoparasites. All affected individuals were male. Additional analyses comparing heterophile:lymphocyte ratios, body condition, parasitemia and survival are pending.

The first year of a study investigating sagebrush passerine health and nutrition was also completed. Sagebrush passerines are dependent upon insects as the main source of protein at nesting grounds during the pre-nesting and nesting periods. Evidence suggests that timing of insect emergence may be impacted by climate change, potentially altering food availability and negatively impacting nutrition and health of nesting passerines. Gathering baseline data on insect presence, timing of insect emergence, and timing of passerine arrival, passerine nutrition and health during nesting periods is essential to understanding impacts of climate change on these in the future. Data collections for 2011 have been completed and insect identification and sorting, and stable isotope analyses are underway.

Powerline strike mortality and the occurrence of botulism outbreaks

One project at Madison WMD investigated co-occurrence of powerline strike mortality and botulism in prairie pothole wetlands. Increased development of wind energy across the U.S. has led to the need for more and larger transmission lines to bring the power to market. In the Prairie Pothole region, this is leading to many miles of additional transmission lines in close proximity to wetland habitats and associated avian populations. The concern is that mortality due to powerline strikes may increase, with the potential to trigger botulism outbreaks in these wetland habitats. This project preliminarily investigates levels of powerline strike mortality in an area experiencing explosive growth in wind energy, and whether botulism occurs in wetlands where powerline strike mortality occurs. Work completed in 2011 included mapping powerlines in relation to wetlands and selecting study locations based on proximity and size of adjacent powerlines, and physical characteristics of wetlands (size, depth, persistence of water) that might be conducive for botulism. Preliminary mortality surveys were also completed, though extreme flooding in the district may have impacted botulism occurrence.

WHO Operations and Technical assistance

Support

Region 6 WHO staff in 2011 consisted of a wildlife veterinarian, 2 wildlife biologists, 1 biotechnician, and 2 STEP students. Avian Health funding offset a portion of the costs for these positions to perform duties associated with administering the Avian Health Program.

Technical assistance

WHO staff routinely provide technical assistance on a variety of state, regional and national issues. In 2011 we provided avian health technical assistance to state agencies and refuges throughout the region. Examples of assistance include:

- Review results from NWHC and follow up with refuges to provide interpretation and management recommendations as necessary.
- Provide PPE guidance for pelican banding activities to minimize transmission of pathogens between banding staff and chicks.
- Educate surveillance staff regarding carcass condition, submission, and impacts of carcass quality on specific diagnostic tests.

- Provide education on avian botulism epidemiology to one District with no avian disease experience.
- Work with refuges to identify simple ways to initiate avian health monitoring by incorporating surveillance into existing refuge activities and planning documents.
- Facilitate communication with diagnostic labs to ensure refuges obtained desired diagnostic information.
- Disseminate information to refuges throughout the region to keep them apprised of current disease and health issues in their areas.
- Review and provide feedback on refuge planning documents to ensure avian health is properly integrated into refuge operations.
- Conduct site visits to provide training, respond to mortality events, and make site specific recommendations.

On site assistance was provided to four refuges (Chase Lake NWR, Arrowwood NWR, Red Rock Lakes NWR and Madison WMD). Assistance ranged from guidance for project development to providing education and technical expertise during mortality events. For example, during an ongoing mortality event at Chase Lake NWR, WHO staff provided on site assistance with aspects of the field investigation and discussed potential management implications of mortality on reduced productivity of pelicans. Concurrent meetings with USGS Northern Prairie Research staff identified some specific questions with regards to the impact habitat may have on pelican chick mortality. Habitat manipulation has been proposed to reduce mortalities that are presumed to be due to exposure and hypothermia. WHO staff discussed the need for additional monitoring to document causes of mortality before we can evaluate habitat alteration as a treatment option, and the need for pre- and post-treatment mortality surveillance in the event habitat work is conducted to assess effectiveness.

Infrastructure and provisions

WHO developed a regional Avian Health database to manage data associated with avian health and disease monitoring. We also began development of a regional GIS disease effort to allow us to more easily discern spatial and temporal patterns in disease occurrence. WHO maintained an inventory of PPE and supplies for mortality response and investigation that were distributed as needed to refuges throughout Region 6. Infrastructure maintained by WHO in support of Avian Health activities included storage facilities for supplies, vehicles and boats for on-site travel and field investigations, as well as several cooperative agreements and contracts with various diagnostic labs nationally.

Communications and informing policy

WHO developed an intranet site to disseminate information on Regional wildlife health programs (including the Avian Health Program) and provide access to protocols and datasheets to aid staff in mortality investigation, response and sample collection. We also developed a fact sheet for the exotic trematode *Cyathocotyle bushiensis* that was distributed to eastern Dakota refuges to educate staff about this emerging invasive disease threat to waterbirds. The Chief, Wildlife Health produced Wildlife Health Updates to provide relevant, up to date health information to state and federal managers. Staff met with regional zone biologists to educate

them about the new Avian Health program and to identify avian health needs within the zones, and to discuss ways to provide additional avian health education to refuge staff by dovetailing efforts with those of the zone biologists.

Collaborations

We collaborate with Kansas Department of Wildlife and Parks to conduct mortality surveillance at several refuges and wildlife areas across the state. Kansas DWP is developing a proposal for additional avian health work in collaboration with Kansas State University.

One project in North Dakota conducted mortality surveillance across 4 refuge complexes at waterbird nesting colonies found in proximity to piping plover and least tern nesting sites to assess mortality risks to these T&E species. This surveillance is being conducted with cooperation from the Alkali Lakes Piping Plover Recovery Team (FWS and The Nature Conservancy) as well as North Dakota Game and Fish Department. An additional element of this project is assistance for an ongoing study of contaminants and Franklin's gull survival and nest success at Beaver Lake WPA being conducted jointly by USFWS Ecological Services and North Dakota State University.

The project examining nutrition and health of sagebrush passerines involves multiple collaborators including USFWS, Montana Fish Wildlife and Parks, University of Montana-Western, The Nature Conservancy, and USGS.

USGS Northern Prairie Wildlife Research Unit has a long history of collaboration with Chase Lake NWR and actively participates in the mortality surveillance project being conducted there, as well as efforts to monitor pelican productivity.